

**CLAIMS**

What is claimed is:

1. A recording device comprising:  
at least one potentiometric electrode;  
5 at least one amperometric electrode on the device with said potentiometric electrode, wherein said electrodes are located on the same device; and  
circuitry for eliminating frequency noise.
2. The device according to claim 1, wherein said circuitry  
10 includes a Notch filter.
3. The device according to claim 1, wherein said circuitry includes op amps.
4. The device according to claim 3, wherein said op amp are selected from the group consisting essentially of a Folded Cascode op amp and a  
15 medium push pull op amp.
5. The device according to claim 1, wherein said circuitry includes transistor level switching.
6. A device for measuring neurochemical and neuroelectrical activity in tissue culture, comprising:  
20 at least one potentiometric electrode;  
at least one amperometric electrode interconnected to said potentiometric electrode, wherein said electrodes are located on the same device; and  
circuitry for eliminating frequency noise.
- 25 7. The device according to claim 6, wherein said circuitry includes a Notch filter.
8. The device according to claim 6, wherein said circuitry includes op amps.
9. The device according to claim 8, wherein said op amp are selected from the group consisting essentially of a Folded Cascode op amp and a  
30 medium push pull op amp.
10. A chip for measuring neurochemical and neuroelectrical activity in tissue culture, comprising:

at least one potentiometric electrode;

at least one amperometric electrode interconnected to said potentiometric electrode, wherein said electrodes are located on the same device; and

5                                   circuitry for eliminating frequency noise.

11.    The chip according to claim 10, wherein said circuitry includes a Notch filter.

12.    The chip according to claim 10, wherein said circuitry includes op amps.

10       13.    The chip according to claim 12, wherein said op amp are selected from the group consisting essentially of a Folded Cascode op amp and a medium push pull op amp.

14.    The chip according to claim 10, wherein said chip is hybrid analog and digital.

15       15.    The chip according to claim 14, wherein said chip is capable of initiating amperometry during periods of neural action potential activity.

16.    The chip according to claim 15, wherein said chip is capable of automated control without the necessity of an external controlling computer.

17.    On-chip closed loop control circuitry comprising an  
20    amperometric sensing system, a potentiometric sensing system, at least one differentiator connected to said amperometric and potentiometric sensing systems, at least one integrator connected to said amperometric and potentiometric sensing systems, and noise reduction means.

18.    Software for controlling the chip according to claim 10.

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